

Mechanisms causing Microcystis blooms and foodweb impacts in the upper San Francisco estuary: a life cycle approach

Charles R Goldman

Public Comments

No public comments were received for this proposal.

Technical Synthesis Panel Review

Proposal Title

#0254: Mechanisms causing Microcystis blooms and foodweb impacts in the upper San Francisco estuary: a life cycle approach

Final Panel Rating
inadequate

Technical Synthesis Panel (Primary) Review

TSP Primary Reviewer's Evaluation Summary And Rating:

I found the proposal interesting and it clearly addresses the important problem of increasing Microcystis blooms. I did find it difficult to determine how the research would give clear answers on the causes and potential controls of the blooms. This fault is major and makes the proposal weak.

Additional Comments:

One of the external reviewers criticized the proposal for being too short. Many of the proposals that we had to review were way too long; so briefness should be praised. However, more pertinent information could have been given in the proposal, not necessarily taking much more space.

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#0254: Mechanisms causing Microcystis blooms and foodweb impacts in the upper...

Technical Synthesis Panel (Discussion) Review

TSP Observations, Findings And Recommendations:

Two of the three external technical reviews were very negative and the third, which was more positive overall, included damning criticism under the "monitoring" section of the review. Numerous hypotheses are identified; however, the panel felt there was inadequate documentation of the approach that would be used to address these hypotheses. The project appears to be more of a "fishing" expedition. It is likely to generate some useful data; however, there is not a coherent conceptual framework for analyzing these data. Had the proposal been re-oriented as an exploratory, data-gathering study it would have received higher reviews. Alternatively, if the applicant had presented a well-conceived program designed to address (1) where the blooms originate and (2) how they spread, the panel rating would be higher. Currently, the project addresses a potentially important topic with a poorly thought-out experiment design with significant disconnects between experiments and hypotheses to be tested by those experiments.

Rating: Inadequate

Technical Review #1

proposal title: Mechanisms causing Microcystis blooms and foodweb impacts in the upper San Francisco estuary: a life cycle approach

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	The goals are two-fold: to determine what's causing Microcystis to bloom in the delta and to assess its effects on the food web. Objectives include determining the extent of diel and vertical distribution of Microcystis biomass during blooms, size distribution of colonies, mechanisms triggering recruitment from the sediments and the fate of carbon and microcystin transfer to zooplankton. A study of this kind is timely and important because Microcystis blooms are a recent and emerging phenomenon that may be spreading and it's a problem that could be exacerbated by the flooding of islands or other ecosystem restoration actions that call for the creation of shallow water habitat.
Rating	very good

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Comments	A lot is known about Microcystis in general, but not about its distribution, behavior and toxicity in the
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#0254: Mechanisms causing Microcystis blooms and foodweb impacts in the upper...

Technical Review #1

	Delta. So this study is justified. The conceptual model in the proposal is clearly stated and consistent with what is known about Microcystis in other systems.
Rating	excellent

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	The proposed approach is adequate and feasible and should allow the investigators to meet their objectives. Results of this study may be useful to decision makers, especially in regard to shallow water habitat restoration, if a way can be found to scale the results up to a delta-wide perspective.
Rating	very good

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	Approach is well documented and likelihood of success is high. Lehman's studies on Microcystis in the Delta suggest that the Van Dorn sampler may not be an effective way to sample Microcystis in the field, however. If they haven't already, I urge the investigators to contact Dr. Lehman about other sampling methods. The proposed lab studies should work OK.
Rating	very good

Technical Review #1

Monitoring

If applicable, is monitoring appropriately designed (pre–post comparisons; treatment–control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	Results of this study could be used in conjunction with Lehman's monitoring work to scale up the study's findings to more than just two sites. The proposal cites Lehman's work to date, but includes no provisions for incorporating it into the analysis. Without this synthesis, I find it hard to believe how the study could answer one of its most interesting questions, namely 'Exactly when and where are the blooms originating and how are they spreading?'
Rating	poor

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	The delta-specific information regarding <i>Microcystis</i> physiology and trophic effects would be of value in formulating plans for dealing with this organism in the future.
Rating	very good

Additional Comments

Comments	Have a chat with Peggy Lehman.
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Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

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Technical Review #1

Comments	Goldman's credentials and track record are unimpeachable. I presume that he has selected capable people to work on this project.
Rating	excellent

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	\$93 K for a two-year effort is adequate and consistent with similar efforts of this kind.
Rating	good

Overall

Provide a brief explanation of your summary rating.

Comments	I recommend this study for funding because it will generate timely and useful information about an emerging problem that threatens ecosystem restoration efforts as well as drinking water quality. The levels of Microcystis in the delta are probably not a public health threat yet, but getting a handle on its local physiology and effects on fish food organisms is a prudent thing to do. The results of this study should be combined with Lehman's monitoring work throughout the delta.
Rating	very good

Technical Review #2

proposal title: Mechanisms causing Microcystis blooms and foodweb impacts in the upper San Francisco estuary: a life cycle approach

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	-The goals and hypotheses are clearly stated, however, objectives are not tied to testable hypotheses.
Rating	fair

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Comments	-This proposal addresses topics germane to CALFED restoration activities. -Conceptual model is too broad to be very useful. -Lacks sufficient literature review.
Rating	good

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	
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#0254: Mechanisms causing Microcystis blooms and foodweb impacts in the upper...

Technical Review #2

	-The scientific approach is does not address the Objectives of the proposal. -Not novel - has been done elsewhere.
Rating	poor

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success?
Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	-Not likely to succeed as designed. -Serious disconnect between Goals and Approach.
Rating	poor

Monitoring

If applicable, is monitoring appropriately designed (pre–post comparisons; treatment–control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	
Rating	not applicable

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	-Products are not adequately defined. -Expectations are nebulous. -I expected to see some sort of modeling of phytoplankton community structure under different restoration scenarios.
Rating	good

Technical Review #2

Additional Comments

Comments	-Reads like an unrefined graduate student proposal. -Suspect that PI did not have much to do with development of this proposal.
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Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	-The PI is highly qualified in this field of research and has vast experience in phytoplankton ecology. -PI has strong backgrounds in regional issues.
Rating	excellent

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	-The budget is reasonable and adequate for the project.
Rating	good

Overall

Provide a brief explanation of your summary rating.

Comments	-Poorly thought out experimental design. -Disconnect between Objectives and Approach. -Hypotheses not tested by experimental design. -Impractical approach. -Objectives related to testable hypotheses. -I do not recommend funding this project as it stands.
Rating	fair

Technical Review #3

proposal title: Mechanisms causing Microcystis blooms and foodweb impacts in the upper San Francisco estuary: a life cycle approach

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	The goals, objectives and hypotheses are clearly stated and internally consistent in this proposal, but they do not correspond either to the background material or to the proposed work. For example, Question 1 (Hypothesis 1) deals with where the blooms are coming from in the Delta, yet the proposed research will sample only two sites. Question 2 asks why the blooms are increasing, yet the proposal quite generally states that unpublished information says that this species was not present in bloom concentrations before 2003, and doesn't give information for 2004. No trends are presented. Question 3 deals with recruitment pathways, yet only two sites are being sampled. Question 5 deals with growth and reproduction, yet the proposal gives no methods for how either will be measured. Question 6 deals with the potential for HNF to increase essential fatty acid content, yet the proposal does not include methods or tasks for measurement
Rating	fair

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

#0254: Mechanisms causing Microcystis blooms and foodweb impacts in the upper...

Technical Review #3

Comments	There is some justification for this work. The 2003 Microcystis bloom was clearly unusual, and deserves attention.
Rating	good

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	The proposed research will generate information of some value. However it will not meet the objectives as stated; see above. The data will add to the body of knowledge about this important species, but given the limited scope of the sampling, it is unclear whether it will help with management decisions. The "foodweb" experiments are simplistic, but will yield some preliminary information about the palatability of Microcystis in this system.
Rating	fair

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	The approach is poorly documented. The proposal is quite short, 7 ½ pages including the executive summary. More information from Lehman et al. 2004, given that it is not available in the primary literature, would have been quite useful to help the readers understand the history of this species in the Delta. There are almost no methods given. The questions highlighted above require analyses not mentioned within the proposal. And, when mentioned, there is not enough information to leave this reader
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Technical Review #3

	with the confidence that good information will result. For example, the feeding experiments intend to follow 13-C transfer from Microcystis to Daphnia or HNF. How will they separate these organisms from one another? What about release to the surrounding water? No methods are given to assess.
Rating	poor

Monitoring

If applicable, is monitoring appropriately designed (pre–post comparisons; treatment–control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	N/A
Rating	not applicable

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	The quality of the products are directly related to the quality of the data. The quality of the data will be suspect.
Rating	fair

Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

#0254: Mechanisms causing Microcystis blooms and foodweb impacts in the upper...

Technical Review #3

Comments	Dr. Goldman has excellent credentials. He is qualified to oversee the ecological aspects of the project.
Rating	excellent

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	The budget process used by this program is very difficult to evaluate. The breakdown of costs makes it impossible for someone not versed in the program to evaluate. I would suggest the program also include yearly breakdowns in the future. The overall costs seem about right.
Rating	not applicable

Overall

Provide a brief explanation of your summary rating.

Comments	This is a poorly prepared, poorly justified proposal. The premise is a good one, but this work is significantly flawed.
Rating	fair

